

2016 Minerals Yearbook

EGYPT

THE MINERAL INDUSTRY OF EGYPT

By Mowafa Taib

In 2016, Egypt was not a significant world producer of minerals, but it was a top producer of several mineral commodities in continental Africa and in the Middle East and North Africa region. Egypt was Africa's leading producer of cement, direct-reduced iron (DRI), feldspar, gypsum, and nitrogen fertilizer; the second-ranked producer of crude (raw) steel, phosphate rock, and refined petroleum products; the third-ranked producer of natural gas; and the fourth-ranked producer of crude petroleum. Within the Middle East and North Africa region, Egypt was the third-ranked producer of ammonia, cement, crude steel, gypsum, and phosphate rock. Metal and mineral-based commodities produced in Egypt included ferroalloys, gold, iron ore, manganese, primary and secondary aluminum, and secondary copper. Egypt also produced such industrial minerals as barite; bentonite; dolomite; feldspar; fluorspar; granite; gypsum; kaolin; limestone; marble; quartz; sodium compounds, such as salt and soda ash; sand and gravel; silica sand; sulfur; talc; and vermiculite (table 1; BP p.l.c., 2017, p. 8, 16, 22; Midrex Technologies, Inc., 2017, p. 7, 8; World Steel Association, 2017, p. 2, 97; Apodaca, 2018; van Oss, 2018).

Minerals in the National Economy

In calendar year 2016, the gross domestic product (GDP) of Egypt increased in real terms by 4.3% compared with an increase of 4.4% in 2015. In fiscal year 2016 (July 1, 2016, through June 30, 2017), the share of the mining and hydrocarbon sectors combined decreased to 11.8% of the GDP from 12.5% in fiscal year 2015 (July 1, 2015, through June 30, 2016). The share of the manufacturing sector, which included aluminum, cement, fertilizers, and iron and steel production, and the refining of petroleum products, decreased to 15.6% of the GDP from 15.8%, and the share of the construction sector increased to 5.4% of the GDP from 5.1%. In real terms, the value of mining and hydrocarbon sector activity combined decreased by 1.8% in fiscal year 2016 compared with a decrease of 5.3% in fiscal year 2015; manufacturing sector activity increased by 2.1% in fiscal year 2016 compared with 0.8% in fiscal year 2015; and construction sector activity increased by 9.5% in fiscal year 2016 compared with 11.2% in fiscal year 2015 (Central Agency for Public Mobilization and Statistics, 2017, p. 112; International Monetary Fund, 2018).

In fiscal year 2016, the flow of foreign direct investment (FDI) into Egypt increased by about 17% to \$7.9 billion from \$6.9 billion in fiscal 2015 and \$4.6 billion in fiscal 2014. The increase was mainly attributed to the discovery of natural gas reserves in Egypt's Western Desert, which continued to attract investment into the country's hydrocarbon sector. The flows of FDI out of Egypt to the rest of the world increased by about 14% to \$207 million in 2016 from \$182 million in 2015. Most of the FDI inflows to Egypt in fiscal year 2016 went to the petroleum sector (61.2%). The manufacturing sector received 5.8% of the FDI, and the construction sector, 0.9%; the remaining FDI (22.4%)

was undistributed (United Nations Conference on Trade and Development, 2017, p. 46, 222; Central Bank of Egypt, 2018, p. 57–58).

Government Policies and Programs

The Government took several steps in 2015–16 as part of its economic reform program to address its soaring current account deficit and public debt that have affected the country's economic growth, including that of the mineral sector. These steps included liberalizing the foreign exchange rate of the Egyptian pound to eliminate foreign currency shortages, encourage investment, and increase exports; cutting Government subsidies for mineral fuels; and imposing tariffs on a wide range of products, including steel-reinforcing-bar products imports (International Monetary Fund, 2017).

Egypt's new mining law (law No. 198 of December 8, 2014) became effective in 2015. The new mining law increased the annual exploration and mining fees for each square kilometer of a permit area to 5,000 Egyptian pounds per square kilometer¹ (\$570 per square kilometer) from 40 Egyptian pounds per square kilometer (\$4.6 per square kilometer). The law also introduced a 5% royalty on annual production to be paid by mining companies to the Government plus a 1% "corporate social responsibility" fee for the development of local municipalities in which the mining company operates (Egyptian Mineral Resources Authority, 2015b, p. 4; 2015c, p. 11, 15; Kabil, 2015).

Investment law No. 8 of 1997 provides the legal framework for several mining companies that were established in the country in the early 2000s. Law No. 198 of 2015 protects investments in the country of both foreign and domestic companies against nationalization and provides incentives for investing in mining and in the manufacturing of fertilizers and petrochemicals in the country's free trade zones.

In 2015, the Government outlined the country's medium-term development strategy for international and local investors and provided an overview for potential investment opportunities in all sectors of the Egyptian economy. Potential projects in the mining sector included bentonite mining and processing at the El Sebaaya Valley; countrywide bidding rounds for mineral exploration licensing; the development of the Golden Triangle gold project, and other associated mineral-exploration projects in the areas of Qena, El Quseir, and Safaga; and the construction of a phosphate-based products plant at the Abu Tartour phosphate rock mine (Egypt for the Future, 2015, p. 29; Egyptian Mineral Resources Authority, 2017).

Production

Notable increases in mineral commodity output in 2016 compared with that of 2015 included that of gypsum (by 152%), coke (71%),

¹ Where necessary values have been converted from Egyptian pounds (EGP) to U.S. dollars at the annual average exchange rate of 8.78EGP=US\$1.00.

other refined petroleum products (57%), ammonia (56%), sulfur (petroleum, byproduct) (52%), sulfuric acid (49%), phosphoric acid (40%), gold (26%), and kerosene and jet fuel (11%). Notable decreases in mineral commodity production in 2016 compared with that of 2015 included that of soda ash (by 69%), manganese (Mn content) (45%), talc (41%), gasoline (29%), lubricants (26%), urea (17%), wire rod (16%), total refinery production (11%), and ferrosilicon and fluorspar (10% each). Data on mineral production are in table 1.

Structure of the Mineral Industry

The structure of the mineral industry of Egypt was mixed in terms of ownership. It included private, public, and state-owned companies. Some international mining and petroleum companies formed joint ventures with local public and state-owned companies. The Ministry of Petroleum and Mineral Resources (MPMR) managed the country's mining and hydrocarbon sectors. The MPMR had five independently managed entities—Egyptian General Petroleum Corp. (EGPC), Egyptian Natural Gas Holding Co. (EGAS), Egyptian Petrochemical Holdings Co., Egyptian Mineral Resources Authority (EMRA), and Ganoub El Wadi Petroleum Holding Co. (Ganope). The EMRA was responsible for conducting geologic mapping and mineral exploration and for issuing mining permits; it held shares in three mining companies—Al Wadi Al Gadid Company for Mineral Resources and Oil Shale (Wadico), the Egyptian Company for Mineral Resources (ECMR), and Shalateen Mineral Resources Co. The EMRA's mineral development strategy was to mine 60% of the country's mineral reserves within the next 30 years and leave the remaining 40% untouched (Egyptian Company for Mineral Resources, 2015; Egyptian Mineral Resources Authority, 2015a; Ministry of Petroleum and Mineral Resources, 2017).

Wadico was formed in 2007 in Kharga City to develop oil shale and mineral resources in the New Valley in southwestern Egypt. The company's shareholders were Ganope (65%), Petrojet Co. (25%), Nile Petroleum Co. (5%), and EMRA (5%). Wadico had the capacity to produce unspecified quantities of ball clay, feldspar, iron oxide (hematite and limonite), kaolin, phosphate rock, quartz, and talc at the Kharga Oasis in the Western Desert. The company planned to produce calcium carbonate for soda ash, granite, limestone for cement, and marble (Al Wadi Al Gadid Company for Mineral Resources and Oil Shale, 2017).

The Holding company for Chemical Industries was an Egyptian joint-stock holding company that held majority and minority ownership in 18 chemical production companies in Egypt, including Delta Fertilizers and Chemical Industries (ASMEDA), Egyptian Chemical Industries (KIMA), El Mex Salinas Co., El Nasr Fertilizers and Chemical Co. (SEMADCO), El Nasr Salinas Co., Misr Chemical Industries Co., and Sinai Manganese Co. (Holding Company for Chemical Industries, 2018).

The Holding Company for Metallurgical Industries (HCMI) was an Egyptian joint-stock holding company created to operate under the Ministry of Business Sector; its affiliates composed the major mining and processing companies in Egypt, including Aluminium Co. of Egypt (Egyptalum), Delta Steel Mill Co., Egyptian Co. for Metallic Construction, Egyptian Copper Works Co., Egyptian Ferroalloys Co., Egyptian Iron and Steel Co. (Hadislob), El Nasr Coke and Chemicals Co., El Nasr Forging Co.,

El Nasr Mining Co., El Nasr Pipes and Fittings Co., and the General Co. for Ceramics and Porcelain. El Nasr Mining produced ball clay, barite, clay, feldspar, fluorspar, gypsum, ilmenite, iron oxide, kaolin, magnesite, phosphate rock, quartz, and talc. The company exported mineral commodities from its three export ports at Abu Ghusun, Hamrawein, and Safaga on the Red Sea. Table 2 is a list of major mineral industry facilities (El Nasr Mining Co., 2017; Holding Company for Metallurgical Industries, 2017).

In 2016, the Ministry of Defense owned and operated several companies that produced mineral commodities for civilian and military use; they included Abu Zaabal Fertilizer Co., El-Arish Cement Co., El Nasr Company for Intermediate Chemicals, Helwan Company for Nonferrous Industries, and Helwan Iron Foundries. The increased involvement of the Ministry of Defense of Egypt in the industrial sector in recent years raised some concerns by the private sector in the country because projects carried out by the armed forces were exempt from paying value-added tax in 2016 and did not have to go through the normal bidding process used by other Government agencies and public-sector organizations (Federation of American Scientists, 2018; Thomson Reuters, 2018b).

Mineral Trade

Egypt's total exports increased by 2% to \$22.5 billion in 2016 from \$22.0 billion in 2015. The main mineral commodities exported by Egypt in 2016 included aluminum, cement, feldspar, ferroalloys, gold, iron and steel, kaolin, manganese, nitrogen fertilizer, phosphate rock, quartz, salt, secondary copper, and talc. In 2016, crude petroleum exports decreased by 9% to \$1,808 million from \$1,994 million in 2015, and refined petroleum products exports decreased by 36% to \$945 million from \$1,486 million, whereas gold exports increased by 319% to \$2,646 million from \$631 million, and nitrogen fertilizer exports increased by 131% to \$767 million from \$332 million (United Nations Statistics Division, 2017, p. 160).

In fiscal year 2015 (the latest period for which data were available), Egypt exported 3.8 million metric tons (Mt) of phosphate rock valued at \$196 million; 88,000 metric tons (t) of quartz valued at \$6.1 million; 40,000 t of manganese valued at about \$1.8 million; 39,000 t of talc valued at \$11.2 million; 33,000 t of iron oxide valued at about \$1.8 million, 19,000 t of kaolin valued at about \$1.9 million; and 7,500 t of feldspar valued at \$539,000 (Sayed, 2016).

The total tonnage of mineral exports by HCMI-affiliated companies in fiscal year 2016 was 2.1 Mt valued at \$459 million. Egyptalum exported 153,000 t of aluminum products valued at \$311 million to countries in Europe and to neighboring countries, such as Libya, Morocco, and Sudan, and, to a lesser extent, Syria. Egyptian Ferroalloys exported 60,477 t of ferrosilicon valued at about \$46 million mainly to countries in Europe and to such other countries as Algeria, Japan, Jordan, Saudi Arabia, Sudan, and Turkey. Hadislob exported 47,000 t of iron and steel products valued at \$18 million to neighboring Arab countries, such as Kuwait, Saudi Arabia, Sudan, Syria, and Yemen. Egyptian Copper Works Co. exported 1,860 t of aluminum and copper products valued at \$5.3 million to Algeria, Cyprus, Ethiopia, Jordan, Saudi Arabia, and Tunisia.

El Nasr Coke Co. exported 52,700 t of coke, ammonia, and nitric acid valued at \$14.2 million to India, Jordan, the Palestinian territories (West Bank and Gaza Strip), and Turkey. El Nasr Mining exported 1.1 Mt of phosphate rock valued at \$34.3 million to India; about 300,000 t valued at \$11.8 million to Indonesia; 6,760 t valued at \$270,000 to Spain; and 3,300 t valued at \$145,000 to Brazil. The company also produced the following mineral commodities that were used for domestic consumption: 334,000 t of phosphate rock valued at \$6.9 million; 14,300 t of talc valued at \$1.2 million; 500 t of quartz valued at \$13,000; and 22 t of manganese valued at \$1,000 (Holding Company for Metallurgical Industries, 2017).

The value of Egypt's exports to the United States increased to \$1.5 billion in 2016 from \$1.4 billion in 2015. The main exports were fertilizers, which increased in value to \$52 million in 2016 from \$33 million in 2015; stone, sand, and cement, which decreased to \$13 million from about \$16 million; iron and steel products, which decreased to \$5.9 million from \$6.3 million; other nonferrous metals, which increased to \$3.7 million from \$963,000; other precious metals, which increased to \$2.7 million from \$391,000; and sulfur, which decreased to \$55,000 from \$100,000 (U.S. Census Bureau, 2017b).

In 2016, the total value of Egypt's imports decreased by 22% to \$58.1 billion from \$74.4 billion in 2015. The country's crude petroleum imports decreased to \$1.4 billion from \$1.8 billion in 2015; the value of petroleum products imports decreased to \$3.3 billion from \$7.1 billion, and the value of imports of natural gas and other petroleum gases increased to \$3.2 billion from \$2.5 billion. The value of steel imports decreased to \$1.0 billion from \$1.4 billion in 2015. In terms of tonnage, Egypt imported about 9.2 Mt of semifinished and finished steel products in 2016 compared with 7.9 Mt in 2015. Steel imports included about 4.0 Mt of ingots and semis, 2.7 Mt of long steel products, 1.6 Mt of flat steel products, and 803,000 t of tubular steel products. Egypt also imported 4.1 Mt of iron ore, 1.0 Mt of scrap, 72,000 t of pig iron, and 32,000 t of DRI (United Nations Statistics Division, 2017, p.161; World Steel Association, 2017, p. 57, 62,67, 72, 77, 95, 99, 105, 110).

In 2016, the value of Egypt's imports from the United States decreased by 27% to \$3.5 billion from \$4.8 billion in 2015. The major mineral commodities and mineral-related imports were fuel oil, which decreased in value to \$181 million from \$338 million in 2015, chemicals (decreased in value to \$132 million), other petroleum products (\$134 million), drilling and oilfield equipment (\$89 million), excavation machinery (\$73 million), natural gas (\$23 million), steelmaking materials (\$29 million), and natural gas liquids (\$15 million) (U.S. Census Bureau, 2017a).

Commodity Review

Metals

Aluminum.—Egyptaluminum was the country's sole producer of primary aluminum. The company was owned by HCMI (90%) and private investors (10%). The company had the capacity to produce 320,000 metric tons per year (t/yr) of aluminum products, including billet (95,000 t/yr); rolled products (85,000 t/yr); ingots, slabs, and Tee bar (35,000 t/yr); wire

rods (75,000 t/yr); and foundry alloys and extrusion profiles (15,000 t/yr each). The company also had the capacity to produce 160,000 t/yr of cathode blocks using 140,000 t/yr of petroleum coke (Egyptian Aluminium Co., 2018).

Arab Aluminum Co. S.A.E. produced a wide range of secondary aluminum products, including angles, bars, and tubes; it had the capacity to produce 15,000 t/yr of aluminum products. The company claimed a 40% share of the local market and exported 15% of its output. Other secondary aluminum producers in Egypt included Canex Aluminum, which was a Canadian-Saudi company; Egyptian Aluminium Products Co. (Alumisr), which had two plants at El-Obour city and Helwan; Egyptian Copper Works Co., which produced aluminum sheets and wire; Egyptian International Co. for Aluminum Profiles S.A.E.; and Helwan Company for Nonferrous Industries (table 2; Arab Aluminum Co. S.A.E., 2017).

Gold.—The Sukari Mine was the only gold mine in operation in Egypt in 2016. The mine, which was owned and operated by a 50–50 joint venture of Centamin plc of the United Kingdom and ECMR, processed 11.6 Mt of ore and produced 17,139 kilograms (kg) of gold compared with 10.6 Mt of ore processed and 13,656 kg of gold produced in 2015. The Sukari Mine began production as an open pit mine, and the mine was extended underground in 2011. The measured and indicated mineral resources at the Sukari (open pit and underground combined) were 363.9 t (11.7 million troy ounces) of gold at cutoff grade of 0.3 gram per metric ton (g/t), including 51.4 t of underground reserves. The life of mine for the Sukari Mine was expected to be 20 years at an annual production of more than 16,075 kg (Centamin plc, 2017a, p. 4–7; 2017b).

Thani Stratex Resources Ltd. was a partnership of Thani Emirates Resources Holdings (Thani) (69.6% interest) and Stratex International Plc of the United Kingdom (30.4%) that was formed to focus on gold mine developments in Djibouti, Egypt, and Ethiopia. Thani held the Hodine license at Anbat-Shakoosh, which is located in the Hutite district in southeastern Egypt. Aton Resources Inc. of Vancouver, British Columbia, Canada, was focused on exploring the gold resources of the Arabian-Nubian Shield. The company had been exploring for gold at four blocks in eastern Egypt; these included the Abu Marawat, the Abu Zawal, the Hamama, and the Rouh Al Hadid Blocks (Aton Resources Inc., 2017; Stratex International Plc, 2017).

Iron and Steel.—Egypt's production of raw steel decreased by 9% to 5.0 Mt in 2016 from about 5.5 Mt in 2015. The decrease was attributable to several factors, including the increase in fuel prices by the Government, the shortages in the supply of natural gas to power steel plants, the decreased demand for steel products in the country, and the increased tariff rates during a time of economic change in Egypt. The economic change period started in 2014 and continued through most of 2016. Production of hot-rolled steel increased to about 8.0 Mt from about 7.7 Mt in 2015. Of this amount, 87% was long steel products and 13% was flat steel products. Wire rod output decreased to 736,000 t from 873,000 t and a peak of 1.2 Mt in 2012. DRI production increased slightly to 2.8 Mt in 2016 from 2.7 Mt in 2015 (table 1; World Steel Association, 2017, p. 2, 32, 34–35).

Tantalum.—In 2016, Arrowhead Resources Ltd. (formerly Gippsland Ltd.) of Australia was working on resolving its dispute with ECMR, which was a state-owned company and a partner with Arrowhead in the 50–50 Tantalum Egypt JSC joint venture to develop the Abu Dabbab tantalum-tin-feldspar project. The dispute between ECMR and Arrowhead started when ECMR sought to dissolve the joint venture in 2015 and repossessed the project's property. ECMR claimed that Arrowhead had abandoned the project. In 2015, the Government transferred the project management to the Ministry of Defense, which planned to develop the Abu Dabbab Mine through its subsidiary, El Nasr Mining, in partnership with an international mining company. The combined measured, indicated, and inferred resources of the Abu Dabbab deposit were estimated to be 45 Mt grading 250 g/t tantalum pentoxide (Ta_2O_5) and 0.09% tin at a cutoff grade of 100 g/t Ta_2O_5 (Mining Review Africa, 2010; International Tin Association, 2015; Arrowhead Resources Ltd., 2017).

Industrial Minerals

Cement.—In 2016, cement production in Egypt increased to 55 Mt from about 54 Mt in 2015. The increase in production in 2016 was attributed mainly to the completion of the Government's plan to use coal as an alternative fuel to natural gas at most of the country's cement plants. The conversion was expected to end the series of blackouts and public protests affecting the country. By yearend 2016, the country had 24 integrated cement plants with a total clinker production capacity of about 64 million metric tons per year (Mt/yr) and grinding capacity of 83.6 Mt/yr. Several greenfield cement plant construction projects were underway in 2016, including a 4.4-Mt/yr-capacity plant at Beni Suef, which was being constructed by Sinoma International Engineering Co. Ltd. of China for the Egyptian Armed Forces (table 2; International Cement Review, 2017, p. 123).

Nitrogen.—Production of ammonia increased significantly in 2016 compared with that in the 2012–14 time period. The increase was attributed to the overcoming of the shortages in the supply of natural gas to fertilizer and chemical companies in the country by directly importing natural gas from international companies rather than obtaining it from the state-owned company EGAS. Eight companies produced a combined total of 2.8 Mt of ammonia (nitrogen content) in 2016, which was 56% more than the total in 2015. In 2016, five companies produced 1.0 Mt of urea (nitrogen content), which was 17% less than was produced 2015 (table 1).

In 2016, Misr Fertilizers Production Co. S.A.E. (MOPCO) commissioned production at a newly completed ammonia production unit at the Damietta plant after securing a \$2 billion loan to triple its urea production capacity to about 2 Mt/yr from 650,000 t/yr. As of yearend 2016, MOPCO had the capacity to produce 2 Mt/yr of urea. MOPCO's main shareholders included Arab Petroleum Corp., EGAS, Egyptian Petrochemicals Holding Co., Misr Insurance Co., Misr Life Insurance, Nasser Social Bank, the National Bank of Egypt, and the National Investment Bank (Misr Fertilizers Production Co., 2017).

OCI N.V. of the Netherlands produced ammonia, granulated urea, and other nitrate fertilizers at its plants in Egypt. OCI had a majority ownership in two nitrogen fertilizer companies in Egypt—

EBIC and EFC. The EBIC plant at Ain Al-Sokhnah was 60% owned by OCI (the remaining 40% was owned by EGPC and other minority investors) and had the capacity to produce 730,000 t/yr of anhydrous ammonia. The export-focused plant had a dedicated 8-kilometer pipeline from the plant to a refrigerated bulk liquid export jetty on the Suez Canal. The EFC plant was wholly owned by OCI and had the capacity to produce 1.55 Mt/yr of urea and 325,000 t/yr of ammonium nitrate (OCI N.V., 2017).

Phosphate Rock.—In 2016, Egypt's phosphate rock output was estimated to have increased to 4.3 Mt from a revised 4.1 Mt in 2015. Phosphate Misr Co. S.A.E (PMC) was the leading producer of phosphate rock in the country in 2016; it produced about 1.8 Mt of phosphate rock compared with 2.4 Mt in 2015. PMC had the capacity to produce 5 Mt/yr of phosphate rock grading between 25% P_2O_5 and 31% P_2O_5 . The company operated mines located on the Abu Tartour plateau and in the New Valley. El Nasr Mining was the second-ranked producer of phosphate rock in Egypt in 2016; it produced 1.8 Mt of phosphate rock from the East El Sebaáya Mine, the West El Sebaáya Mine, and the Red Sea Mine at El Quseir (El Nasr Mining Co., 2016). In 2015, Wadico and ECMR produced 568,000 t and 335,000 t of phosphate rock, respectively (Phosphate Misr Co., 2016; Sayed, 2016, p. 123; Al Wadi Al Gadid Company for Mineral Resources and Oil Shale, 2017).

In 2016, PMC was developing a phosphate fertilizer manufacturing complex at the Abu Tartour phosphate rock mine in Al Wadi Al Gadid Governorate. The project would include a phosphate ore treatment unit, a 500,000-t/yr-capacity phosphoric acid production unit, and a sulfuric acid production unit. The \$900 million project would be funded by PMC (25%); Ahli Holding Co. (20%); Abu Qir Fertilizer & Chemical Industries Co., National Investment Bank, Orient Gas Co., Petrojet, Inpi Co. (10% each); and EMRA (5%) (Petroleum Future, 2017).

In 2015, the Government assigned El-Nasr Company for Intermediate Chemicals (a subsidiary of the National Services Products Organization of the Ministry of Defense) to build and operate the Ain-Sokhna Phosphatic Fertilizer Complex at Ain Al-Sokhnah at the southern end of the Suez Canal. The complex was expected to have the capacity to produce 1.2 Mt/yr of phosphate-based fertilizer, including diammonium phosphate, phosphoric acid, and triple superphosphate (MEED, 2015).

Mineral Fuels

Coal.—Although no coal was produced in Egypt in 2016, the Government was looking for investors to reopen the Maghara Mine in North Sinai, which held 21 Mt of proven coal reserves and had been inactive in recent years owing to low production coupled with environmental quality concerns. The country increased its coal imports to 2 Mt in 2016 from 662,000 t in 2015 despite opposition from environmental organizations in the country. Egypt's consumption of coal increased in 2016 following the conversion to coal from natural gas as the fuel used to provide power to aluminum plants, cement plants, coke plants, iron and steel plants, and powerplants in 2015. The costly conversion to coal powerplants from natural gas powerplants was attributed to the Government's backing out of its commitment to supply natural gas to aluminum, cement, coke, iron and steel, and crude steel plants. By the end of 2016, 90% of Egypt's cement

plants had agreed to use coal in their production and had converted their cement plants to use coal. Egypt's coal industry was expected to receive a \$30 billion investment by domestic and foreign companies in the next 5 years to cover the cost of building two coal-fired powerplants (Green, 2015; Sayed, 2016, p. 117; Sarant, 2017).

Natural Gas.—In 2016, Egypt's natural gas production continued its downward trend, which started after 2012. Dry gas production decreased by 5% to 42 billion cubic meters in 2016 from 44 billion cubic meters in 2015 and 61 billion cubic meters in 2012. Natural gas consumption increased by 7% to 51.3 billion cubic meters from 47.8 billion meters in 2015. Therefore, Egypt had to import natural gas in 2016 to meet the increased demand. Natural gas imports were supplied by several international oil and gas companies, including BP p.l.c. of the United Kingdom, Royal Dutch Shell plc of the Netherlands, and PetroChina Co. Ltd. of China, through two floating storage and regasification units. The country's proved natural gas reserves at the end of 2016 were estimated to be about 1.8 trillion cubic meters and accounted for 1.0% of the world's total natural gas reserves. Egypt was responsible for 1.2% of the world's total natural gas production in 2016. Eighteen natural gas discoveries were made in Egypt in 2016 compared with 17 discoveries in 2015. In fiscal year 2015, 40.7% of natural gas production came from Matrouh offshore area in the Mediterranean Sea, 24% from South Sinai, 13.4% from Dakahlia, 13.1% from the Red Sea, 4.5% from Port Said, 3.8% from Damietta, 0.4% from North Sinai, and 0.1% from Alexandria (BP p.l.c., 2017, p. 26, 28, 29; Central Agency for Public Mobilization and Statistics, 2016, p. 84; Organization of Arab Petroleum Exporting Countries, 2017, p. 22).

In 2016, Eni Group of Italy produced natural gas at the Baltim, the El Tamsah, and the Ras el Barr gasfields in the Nile Delta and North Port Said concessions. In 2015, the company signed an agreement with the Government to invest \$5 billion to develop crude petroleum and gas reserves in the country. In 2015, Eni discovered a gasfield at the Zohr prospect in the deep water offshore Egypt. The Zohr gas discovery was the largest discovery in Egypt and the Mediterranean Sea; it was estimated to hold 850 billion cubic meters (30 trillion cubic feet). Development of the Zohr gasfield was fast-tracked, and production during the first stage of the project was expected to begin in the second half of 2017. Production in the first stage was expected to be 28.3 million cubic meters per day (about 1 billion cubic feet per day). The second stage of the \$16 billion Zohr gasfield project was expected to be completed by yearend 2019; during the second stage, production was projected to increase to 76.5 million cubic meters per day (2.7 billion cubic feet per day) (Eni Group, 2015, 2016; Daily News Egypt, 2017a, b).

Petroleum.—The output of crude petroleum (and condensate) decreased in 2016 to 252 million barrels (Mbbl) from about 265 Mbbl in 2015. Egypt accounted for less than 1% of the world's total output of crude petroleum. Consumption of crude petroleum by Egypt had been increasing in recent years; it averaged 311 Mbbl in 2016 compared with 303 Mbbl in 2015 and 273 Mbbl in 2012. More than one-half of Egypt's crude petroleum production came from the Western Desert, and the remainder came from the Eastern Desert, the Gulf of Suez, the

Mediterranean Sea, the Nile Delta, Upper Egypt (southern Egypt), and the Sinai Peninsula. In 2016, 27 petroleum discoveries were made in Egypt compared with 26 discoveries in 2015. The country held 3.5 billion barrels of proved petroleum reserves (BP p.l.c., 2017, p. 12, 14, 15; Organization of Arab Petroleum Exporting Countries, 2017, p. 20).

In 2016, Egypt's combined refinery throughput at its eight refineries was 508,000 barrels per day (bbl/d), which was significantly less than the installed refining capacity of 721,500 bbl/d. The Government planned to increase its petroleum refining capacity by building a new refinery to meet the increased demand for refined petroleum products in the local market. Egyptian Refinery Co., which was a joint venture of EGPC and Arab Refinery Co., was building a new refinery at Mostorod near Cairo; it would have the capacity to produce 174,400 bbl/d of refined petroleum products. The refinery was expected to begin production in 2019 at a cost of \$4.1 billion and would cut Egypt's imports of distilled gas fuel by 50%, and of gasoline, by 40% (BP p.l.c., 2017, p. 22, 23; Thomson Reuters, 2018a; U.S. Energy Information Administration, 2018, p. 5).

Outlook

In 2016, the Government implemented an economic reform program to reduce its current account deficit and enhance foreign investment. This program included liberalizing the foreign exchange rate of the Egyptian pound, reducing fuel price subsidies, and increasing tariffs on imports. Egypt's natural gas production is expected to increase during the next 5 years following recent discoveries in the Nile Delta and offshore in the Mediterranean Sea. The Government expects that the country will produce enough natural gas to meet domestic demand by 2019 and would become a net natural gas exporter by 2022. Production of metal commodities, such as aluminum, gold, and iron and steel products, is likely to increase in the next 5 years. Mining output, especially that of such industrial mineral commodities as cement, nitrogen, phosphate fertilizers, and phosphate rock, is expected to increase significantly in the short term.

References Cited

- Al Wadi Al Gadid Company for Mineral Resources and Oil Shale, 2017, Mining: Al Kharga, Egypt, Al Wadi Al Gadid Company for Mineral Resources and Oil Shale. (Accessed February 26, 2018, at <http://www.wadico.net/index-3.html>.)
- Apodaca, L.E., 2018, Nitrogen (fixed)—Ammonia: U.S. Geological Survey Mineral Commodity Summaries 2018, p. 116–117.
- Arab Aluminum Co. S.A.E., 2017, Company profile: Cairo, Egypt, Arab Aluminum Co. S.A.E. (Accessed January 31, 2018, at http://www.arabaluminum.com/arab_al/topic.php?t=Profile.)
- Arrowhead Resources Ltd., 2017, Projects: Perth, Western Australia, Australia, Arrowhead Resources Ltd., 2017. (Accessed April 17, 2018, at <https://www.arrowheadresources.com.au/services>.)
- Aton Resources Inc., 2017, Projects—The Abu Marawat concession: Vancouver, British Columbia, Canada, Aton Resources Inc. (Accessed April 13, 2018, at <http://www.atonresources.com/project/abu-marawat-concession>.)
- BP p.l.c., 2017, BP statistical review of world energy: London, United Kingdom, BP p.l.c., June, 49 p. (Accessed August 25, 2017, at <https://www.bp.com/content/dam/bp/en/corporate/pdf/energy-economics/statistical-review-2017/bp-statistical-review-of-world-energy-2017-full-report.pdf>.)
- Centamin plc, 2017a, Annual report 2016: London, United Kingdom, Centamin plc, February 1, 152 p. (Accessed April 13, 2018, at http://www.centamin.com/~media/Files/C/Centamin/documents/reports/2017/Smart_Centamin_AR16_Book_v05.pdf.)

- Centamin plc, 2017b, Production—Sukari: London, United Kingdom, Centamin plc. (Accessed January 13, 2018, at <http://www.centamin.com/production/sukari/overview>.)
- Central Agency for Public Mobilization and Statistics, 2017, Egypt in figures—Industry and petroleum: Cairo, Egypt, Central Agency for Public Mobilization and Statistics. (Accessed January 25, 2018, at http://www.capmas.gov.eg/Pages/StaticPages.aspx?page_id=5035.)
- Central Bank of Egypt, 2018, Annual report 2016/2017: Cairo, Egypt, Central Bank of Egypt, 121 p. (Accessed March 25, 2019, at <https://www.cbe.org.eg/layouts/download.aspx?SourceUrl=%2Fen%2FEconomicResearch%2FPublications%2FAnnualReportDL%2FAnnual%20Report%202016-2017.pdf>.)
- Daily News Egypt, 2017a, Can Egypt become a net gas exporter again?: Daily News [Cairo] Egypt, May 4. (Accessed April 18, 2018, at <https://www.dailynewsegypt.com/2017/05/04/can-egypt-become-net-gas-exporter>.)
- Daily News Egypt, 2017b, Zohr field investments amount to \$16bn: Daily News [Cairo] Egypt, May 16. (Accessed April 18, 2018, at <https://www.dailynewsegypt.com/2017/05/16/zohr-field-investments-amount-16bn/>.)
- Egypt for the Future, 2015, Introducing Egypt economic development conference (EEDC): Cairo, Egypt, Egypt for the Future, 47 p. (Accessed January 31, 2017, at http://www.egyptembassy.net/media/2015_01_20_Investors_Brief_complete-1.pdf.)
- Egyptian Aluminium Co., 2018, Catalog: Cairo, Egypt, Egyptian Aluminium Co., 26 p. (Accessed February 18, 2019, at <http://www.egyptalum.com.eg/catalog.aspx?Lid=9> <http://www.egyptalum.com.eg/pdf/1.pdf>.)
- Egyptian Mineral Resources Authority, 2015a, Companies—Egyptian Company for Mineral Resources: Cairo, Egypt, Egyptian Mineral Resources Authority. (Accessed December 18, 2016, at <http://emra.gov.eg/UI/Lang1/TDIDataShow.aspx?ID=68>.)
- Egyptian Mineral Resources Authority, 2015b, Investment—Mineral Resources Law No. 198 Year 2014: Cairo, Egypt, Egyptian Mineral Resources Authority, December 9, 18 p. (Accessed December 18, 2016, at http://emra.gov.eg/PDF%20files/%D8%A7%D9%84%D9%82%D8%A7%D9%86%D9%88%D9%86_EN.pdf.)
- Egyptian Mineral Resources Authority, 2015c, Investment—The executive regulations of the mineral resources law: Cairo, Egypt, Egyptian Mineral Resources Authority, June 24, 46 p. (Accessed April 18, 2018, at <http://emra.gov.eg>.)
- Egyptian Mineral Resources Authority, 2017, Investment—Bids: Cairo, Egypt, Egyptian Mineral Resources Authority. (Accessed January 27, 2017, at <http://emra.gov.eg/UI/Lang1/TDIDataShow.aspx?ID=60>.)
- El Nasr Mining Co., 2017, Products: Aswan, Egypt, El Nasr Mining Co. (Accessed January 13, 2017, at http://www.elnasrmining.com/default_ar.aspx.)
- Eni Group, 2015, Eni discovers a supergiant gas field in the Egyptian offshore, the largest ever found in the Mediterranean Sea: Rome, Italy, Eni Group press release, August 30. (Accessed January 31, 2017, at https://www.eni.com/en_IT/media/2015/08/eni-discovers-a-supergiant-gas-field-in-the-egyptian-offshore-the-largest-ever-found-in-the-mediterranean-sea.)
- Eni Group, 2016, Eni's activities in Egypt: Rome, Italy, Eni Group. (Accessed January 31, 2017, at https://www.eni.com/enipedia/en_IT/international-presence/africa/enis-activities-in-egypt.page.)
- Federation of American Scientists, 2018, Military factories: Washington DC, Federation of American Scientists. (Accessed March 18, 2019, at <https://fas.org/nuke/guide/egypt/facility/mark0033.htm>.)
- Green, Joseph, 2015, Investment forecast in Egypt's coal industry: Surrey, United Kingdom, Coal World, May 14. (Accessed January 27, 2017, at <https://www.worldcoal.com/coal/14052015/huge-investment-forecast-in-egypt-coal-industry-828>.)
- Holding Company for Chemical Industries, 2018, Affiliated companies: Cairo, Egypt, Holding Company for Chemical Industries. (Accessed March 12, 2019, at <http://cihc-eg.com/index.php/user/affiliated>.)
- Holding Company for Metallurgical Industries, 2017, Exports catalog: Cairo, Egypt, Holding Company for Metallurgical Industries. (Accessed January 13, 2018, at http://www.micor.com.eg/Default_ar.aspx?ID=51.)
- International Cement Review, 2017, Egypt, in the Global Cement Review (12th ed.): Dorking, United Kingdom, International Cement Review, 393 p.
- International Monetary Fund, 2017, Egypt—The economy is gathering strength: Washington, DC, International Monetary Fund, September 26. (Accessed April 19, 2018, at <https://www.imf.org/en/News/Articles/2017/09/25/na092617-egypt-the-economy-is-gathering-strength>.)
- International Monetary Fund, 2018, Countries—Arab Republic of Egypt: Washington, DC, International Monetary Fund. (Accessed April 19, 2018, at <https://www.imf.org/en/Countries/EGY>.)
- International Tin Association, 2015, Abu Dabbab project still in limbo following expropriation dispute: Hertfordshire, United Kingdom, International Tin Association, October 29. (Accessed March 19, 2019, at <https://www.internationaltin.org/abu-dabbab-project-still-in-limbo-following-expropriation-dispute>.)
- Kabil, Maye, 2015, A positive step for mining?: Al-Ahram Weekly [Cairo, Egypt], no. 1228, January 8. (Accessed February 22, 2016, at <http://weekly.ahram.org.eg/News/10076/18/A-positive-step-for-mining-.aspx>.)
- MEED, 2015, Military takes charge of Sokhna Phosphatic fertiliser project: Dubai, United Arab Emirates, MEED, December 17. (Accessed January 30, 2017, at <https://www.meed.com/military-takes-charge-of-sokhna-phosphatic-fertiliser-project>.)
- Midrex Technologies, Inc., 2017, World direct reduction statistics 2016: Charlotte, NC, Midrex Technologies, Inc., 15 p. (Accessed December 15, 2017, at <http://www.midrex.com/assets/user/news/MidrexStatsBook2016.pdf>.)
- Mining Review Africa, 2010, Abu Dabbab developer draws attention to conflict tantalum: Rondebosch, South Africa, Mining Review Africa, June 29. (Accessed March 2019, at <https://www.miningreview.com/top-stories/abu-dabbab-developer-draw-s-attention-to-conflict-tantalum>.)
- Ministry of Petroleum and Mineral Resources, 2017, Projects for investment: Cairo, Egypt, Ministry of Petroleum and Mineral Resources. (Accessed April 18, 2018, at <http://www.petroleum.gov.eg/en/Investment/InvestmentProjects/Pages/default.aspx>.)
- Misr Fertilizers Production Co. S.A.E., 2017, Investor relations: Damietta, Egypt, Misr Fertilizers Production Co. (Accessed April 9, 2018, at <http://www.mopco-eg.com/en/save.php#stocks>.)
- OCI N.V., 2017, Egyptian Fertilizers Company: Amsterdam, Netherland, OCI N.V. (Accessed December 14, 2017, at <http://www.oci.nl/oci-fcg/our-facilities/egyptian-fertilizers-company>.)
- Organization of Arab Petroleum Exporting Countries, 2017, Annual statistical report 2017: Safat, Kuwait, Organization of Arab Petroleum Exporting Countries, 150 p. (Accessed January 13, 2018, at <http://www.oapec.org/media/92042d77-ec09-471a-aafc-4adfl-dce8bce/1262350241/Annual%20Statistical%20Report/Annual%20Statistical%20Report%202017%20.pdf>.)
- Petroleum Future, 2017, [Creation of a \$900 million phosphate company in Al Wadi Al Gadid]: Cairo, Egypt, Petroleum Future, June 20. (Accessed April 18, 2018, at <http://www.petroleumfuture.com>.)
- Phosphate Misr Co., 2017, Ore reserves: Cairo, Egypt, Phosphate Misr Co. (Accessed December 20, 2017, at <http://phosphatemisr.com>.)
- Sarant, Louise, 2017, In post-revolution Egypt, a fierce fight over coal imports: Menlo Park, California, Mongabay.com, April 5. (Accessed December 19, 2017, at <https://news.mongabay.com/2017/04/in-post-revolution-egypt-a-fierce-fight-over-coal-imports>.)
- Sayed, M.A., 2016, [The role of mining sector in supporting Egyptian economy], in Arab International Mineral Resources Conference, 14th, Jeddah, Saudi Arabia, 2016, Proceedings: Rabat, Morocco, Arab Industrial Development and Mining Organization, p. 107–128.
- Stratex International Plc, 2017, Projects—Hutite: London, United Kingdom, Stratex International Plc. (Accessed February 1, 2018, at <https://www.stratexinternational.com/projects/east-africa/hodine-anbat>.)
- Thomson Reuters, 2018a, Egypt's new oil refinery to begin test run in third quarter: Thomson Reuters, May 16. (Accessed March 18, 2019, at <https://www.reuters.com/article/us-egypt-oil/egypts-new-oil-refinery-to-begin-test-run-in-third-quarter-idUSKBN1GH2U0>.)
- Thomson Reuters, 2018b, From war room to boardroom—Military firms flourish in Sisi's Egypt: Thomson Reuters, May 16. (Accessed March 18, 2019, at <https://www.reuters.com/investigates/special-report/egypt-economy-military>.)
- United Nations Conference on Trade and Development, 2017, World investment report 2017: Geneva, Switzerland, United Nations Conference on Trade and Development, 264 p. (Accessed January 12, 2018, at http://unctad.org/en/PublicationsLibrary/wir2017_en.pdf.)
- United Nations Statistics Division, 2017, International trade statistics yearbook 2016—Egypt: New York, New York, United Nations Statistics Division, 428 p. (Accessed April 17, 2018, at <https://comtrade.un.org/pb/downloads/2016/Voll2016.pdf>.)
- U.S. Census Bureau, 2017a, U.S. exports to Egypt by 5-digit end-use code 2006–2015: Washington, DC, U.S. Census Bureau. (Accessed April 9, 2018, at <https://www.census.gov/foreign-trade/statistics/product/enduse/exports/c7290.html>.)

U.S. Census Bureau, 2017b, U.S. imports from Egypt by 5-digit end-use code 2006–2015: Washington, DC, U.S. Census Bureau. (Accessed April 19, 2018, at <https://www.census.gov/foreign-trade/statistics/product/enduse/imports/c7290.html>.)

U.S. Energy Information Administration, 2018, Egypt: U.S. Energy Information Administration Country Analysis Brief, May 24, 16 p. (Accessed October 21, 2019, at https://www.eia.gov/beta/international/analysis_includes/countries_long/Egypt/egypt.pdf.)

van Oss, H.G., 2018, Cement: U.S. Geological Survey Mineral Commodity Summaries 2018, p. 42–43.

World Steel Association, 2017, Steel statistical yearbook 2017: Brussels, Belgium, World Steel Association, 123 p. (Accessed January 13, 2018, at <https://www.worldsteel.org/en/dam/jcr:3e275c73-6f11-4e7f-a5d8-23d9bc5c508f/Steel+Statistical+Yearbook+2017.pdf>.)

TABLE 1
EGYPT: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons, gross weight, unless otherwise specified)

Commodity ²	2012	2013	2014	2015	2016
METALS					
Aluminum, metal:					
Primary	337	307	300	300	296
Secondary ^c metric tons	100	50	90	90	90
Copper, refinery, secondary do.	130 ^e	135 ^e	143	145 ^e	145 ^e
Ferroalloys: ^c					
Ferromanganese	30	30	12 ^r	12 ^r	12
Ferrosilicon	55	51	62	62	56
Gold, mine, Au content kilograms	8,175 ^r	11,102	11,733	13,653	17,139
Iron ore, mine:					
Gross weight	3,930 ^r	1,422	1,697 ^r	1,500	1,500
Fe content	1,800 ^r	900 ^r	1,100 ^r	900 ^r	900
Iron and steel:					
Direct-reduced iron	2,840 ^r	3,432	2,882	2,730 ^r	2,820
Pig iron	550 ^r	550 ^r	550 ^r	500	500
Steel:					
Raw steel	6,627	6,754	6,485	5,506	5,036
Products:					
Hot-rolled	7,265	7,438	8,137	7,676	8,001
Wire rod	1,113	1,219	1,030	873	736
Manganese, mine:					
Gross weight	110 ^r	85	50	34	19
Mn content	33	28	17	11	6
Tin, mine, concentrate metric tons	74 ^{r,e}	80 ^{r,e}	85 ^r	--	--
Titanium, ilmenite and leucoxene do.	--	20,000 ^e	-- ^r	-- ^r	--
INDUSTRIAL MINERALS					
Barite metric tons	2,000 ^{r,e}	3,000 ^r	3,379 ^r	7,540	8,000 ^e
Cement, hydraulic, all types	55,200	50,000 ^e	52,080 ^r	53,940 ^r	55,000
Clay:					
Bentonite metric tons	17,709	4,600	3,615	40,244	40,200
Kaolin do.	300 ^e	300 ^e	300 ^e	232	230 ^e
Feldspar, mine do.	400 ^r	400 ^e	400 ^e	421	400 ^e
Fluorspar do.	7,700 ^e	850 ^e	900 ^e	1,105	1,000
Gypsum	458 ^r	941 ^r	872 ^r	872 ^r	2,200
Lime ^c	800	800	750	720 ^r	700 ^e
Mica ^c	3	3	3	10	10
Nitrogen, N content:					
Ammonia	2,924 ^r	2,655 ^r	2,200	1,800	2,800
Urea	2,000	1,813	1,500	1,200 ^r	1,000

See footnotes at end of table.

TABLE 1—Continued
EGYPT: PRODUCTION OF MINERAL COMMODITIES¹

(Thousand metric tons, gross weight, unless otherwise specified)

Commodity ²	2012	2013	2014	2015	2016
INDUSTRIAL MINERALS—Continued					
Phosphate rock:					
Gross weight	6,236	5,922	5,378 ^r	4,100 ^r	4,300
P ₂ O ₅ content	1,835	1,777	1,620	1,230 ^r	1,290
Phosphoric acid	64	65	120 ^r	50 ^r	70
Salt	2,802	2,194 ^r	1,543	1,550 ^e	1,550 ^e
Soda ash, synthetic ^e	130	130	130	130	40
Sodium compounds, caustic soda	224	164	168	170	170
Stone, sand, and gravel:					
Sand and gravel, construction, gravel	-- ^r	309 ^r	1,948 ^r	2,000 ^{e, 3}	2,000 ^e
Sand and gravel, industrial, silica	448	322	579 ^r	600 ^e	600 ^e
Stone:					
Crushed:					
Basalt	245	245	245	-- ⁴	--
Dolomite	21	20	44 ^r	50 ^{r, e}	50 ^e
Limestone	284	618	82 ^r	100 ^{r, e}	100 ^e
Quartzite	8	4	100	101	100
Sandstone	400	400	400	--	--
Dimension:					
Granite	3	3	10 ^r	3 ⁵	3
Marble, block ⁶	28 ^r	90 ^r	100 ^{r, e}	100 ^{r, e}	100 ^e
Sulfur compounds, sulfuric acid, S content	159 ^r	--	-- ^r	150 ^r	224
Sulfur, petroleum, byproduct, S content	53 ^r	-- ^r	-- ^r	48 ^r	73
Talc and related minerals, talc ^e metric tons	10,000 ^r	10,000 ^r	10,000 ^r	24,400 ^r	14,300
Vermiculite do.	3,000 ^r	3,000 ^r	3,000 ^r	8,190	8,000 ^e
MINERAL FUELS AND RELATED MATERIALS					
Natural gas:					
Gross million cubic meters	66,016 ^r	61,643 ^r	54,057 ^r	49,338 ^r	46,830
Dry basis do.	61,303 ^r	55,528 ^r	48,972 ^r	44,257 ^r	42,007
Petroleum:					
Crude, including condensate housand 42-gallon barrels	260,975	260,610 ^r	261,705 ^r	264,990 ^r	252,215
Natural gas liquids do.	35,077	65,919	62,050	60,079	63,400
Refinery:					
Asphalt do.	2,884 ^r	3,504 ^r	4,052 ^r	4,453 ^r	4,161
Distillate fuel oil do.	53,874 ^r	53,582 ^r	55,078 ^r	56,053 ^r	52,742
Gasoline, including naphtha do.	58,546 ^r	54,020 ^r	48,873 ^r	74,116 ^r	52,867
Kerosene, including jet fuel do.	14,096 ^r	14,126 ^r	15,382 ^r	15,491 ^r	17,228
Liquefied petroleum gas do.	5,835 ^r	5,694 ^r	5,621 ^r	5,912 ^r	5,913
Lubricants do.	1,022 ^r	1,132 ^r	1,095 ^r	1,132 ^r	840
Petroleum coke do.	1,350	1,007	1,880	1,913	3,274
Residual fuel oil do.	60,480 ^r	55,115 ^r	57,122 ^r	57,268	53,546
Other do.	2,847	2,993	3,030	1,278	2,001
Total do.	201,000 ^r	191,000 ^r	192,000 ^r	218,000 ^r	193,000

^eEstimated. ^rRevised. do. Ditto. -- Zero.

¹Table includes data available through March 13, 2018. All data are reported unless otherwise noted. Totals and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²In addition to the commodities listed, ball clay, coal, gemstones, iron oxide pigments, mica, a number of metals, such as lead (which was produced from recycled material), zinc, and manufactured mineral commodities, such as carbon black and glass, may have been produced in Egypt, but available information was inadequate to make reliable estimates of output.

³Converted from cubic meters by multiplying by 1.6.

⁴Converted from cubic meters by multiplying by 3.01.

⁵Converted from cubic meters by multiplying by 2.69.

⁶Converted from cubic meters by multiplying by 2.56.

TABLE 2
EGYPT: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum, primary and secondary	Aluminium Co. of Egypt (Egyptalum) (Holding Company for Metallurgical Industries, 90%, and private interests, 10%)	Smelter at Nag Hammadi	320
Aluminum, secondary	Egyptian Copper Works Co. [Holding Company for Metallurgical Industries (HCMI)]	Plant at Alexandria	50
Do.	Helwan Company for NonFerrous Industries (Ministry of Defense)	do.	45
Do.	Arab Aluminium Co. S.A.E.	Plant at Ismaelia	15
Do.	Egyptian International Co. for Aluminum Profiles S.A.E.	3rd Industrial Zone, Giza	14
Do.	Egyptian Aluminium Products Co. (Alumisir)	Plant at Helwan and El Obour	12
Do.	Al Saad Aluminium Co.	Mostorod	10
Do.	Al Qantara for Ferrous Metals Co,	Suez	25
Do.	Canex Aluminum	CPC Industrial Zone, 6th of October City	NA
Do.	General Metals Co.	Plant at Helwan	6
Barite	El Nasr Mining Co. [Holding Company for Metallurgical Industries (HCMI), 100%]	NA	NA
Do.	Rasheed Performance Minerals Group (RPM)	Borg El Arab Industrial Development Zone	100
Calcium carbonate	ASCOM Carbonate and Chemical Manufacturing (Qalaa Holding, 100%)	El Minya, Upper Egypt	500
Do.	Misr Quarries Development Co. S.A.E	Mine at Attaka Mounitain	NA
Carbon, black	Alexandria Carbon Black Co. (Egyptian Holding Co. for the Chemical Industry, 49%; Inco-Bharat, 36%; Grasim Industries, 15%)	do.	20
Cement	Alexandria Portland Cement Co. (Government, 77%, and private interests, 23%)	Plant at El Mex, Alexandria	2,200
Do.	Amirya Cement Co. [Cimentos de Portugal, SGPS, S.A. (Cimpor)]	Plant Burg Al Arab, Alexandria	4,800
Do.	Arab Swiss Engineering Co. (ASEC) (Suez Cement Co., 68.7%)	Plant at Helwan, Cairo	3,615
Do.	Arabian Cement Co. (Cementos La Union S.A.)	Plant at Ain Al-Sokhna	5,000
Do.	Assuit Cement Co. (Cemex Egypt)	Plant at Assiut	5,500
Do.	El Arish Cement Co. (Ministry of Defense)	Plant at El Arish	4,400
Do.	do.	Plant at Beni Suef ^d	13,000
Do.	Qena Cement Co. (Al Ahly Capital Holding Co., 21.30%; Misr Insurance Co., 11.69%; Egyptian Investment Projects, 10.16%; Egyptian Kuwaiti Investment Co. SAE, 10.07%; National Investment Bank, 9.88%; Misr Life Insurance, 9.37%; Egyptian Federation for Construction and Building Contractors, 9.37%; National QNB Financial Services, 6.69%, other investors, 256%)	Plant at Qena	3,300
Do.	El Sewedy Cement Co.	Plant at Ataqah, Suez	2,300
Do.	Egyptian Cement Co. (Lafarge S.A., 74%, and interests, 26%)	Plant at Ain Al-Sokhna, Suez	8,900
Do.	Helwan Cement Co.	Plant at Helwan, Cairo	4,100
Do.	Misr Beni Suef Cement Co.	Plant at Beni Suef	2,800
Do.	Misr Qena Cement Co. (ASEC Cement Co.)	Plant at Nasr City, Cairo	2,000
Do.	Medcom Cement Co.	Plant at Asawn	950
Do.	National Cement Co. (Government, 77%, and private interests, 23%)	Plant at El Tabbin, Cairo	3,100
Do.	Royal El Minya Cement	Plant at Samallot, El Minya	2,690
Do.	Sinai Cement Co. (Vicat Group)	Plant at El Arish, Sinai	1,500
Do.	South Valley Cement Co.	Plant at Beni Suef Industrial Zone	2,200
Do.	Sinai White Portland Cement Co. (Aalborg Portland A/S)	Plant at North Sinai	900

See footnotes at end of table.

TABLE 2—Continued
EGYPT: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement—Continued		Suez Cement Co. (Italcementi Group)	Plant at Kattameya, Cairo	1,800
Do.		do.	Plant at Suez	3,800
Do.		do.	Plant at El Minya	300
Do.		Titan Cement Egypt (Titan Cement Co., 100%)	Plant at Beni Suef, Alexandria	3,400
Do.		Torah Portland Cement Co.	Plant at Torah, Cairo	4,900
Clay:				
Bentonite		Rasheed Performance Minerals Group (RPM)	Borg El Arab Industrial Development Zone	225
Kaolin		El Nasr Mining Co. [Holding Company for Metallurgical Industries (HCMI), 100%]	Aswan	NA
Do.		Sinai Manganese Co. (Holding Company for Chemical Industries)	Mine at South Sinai	100
Coking coal		El Nasr Coke and Chemicals Co. (Government, 100%)	Helwan	1,400
Copper, refined		Egyptian Copper Works Co. [(Holding Company for Metallurgical Industries (HCMI), 100%]	Hagar El Nouatia, Alexandria	130,000
Do.		Egyptian Metal Works	Cairo	NA
Feldspar		Mining Engineering Company (Knouz)	Aswan	NA
Do.		Misr Quarries Development Co. S.A.E	Attaka Mounitain	NA
Ferromanganese		Sinai Manganese Co. (Holding Company for Chemical Industries)	Abu Zenima, South Sinai	36
Ferrosilicon		Egyptian Ferroalloys Co.	Plant at Idfo, Aswan	50
Fluorspar	metric tons	Egyptian Company for Mineral Resources (ECMR)	NA	4,500
Do.	do.	El Nasr Mining Co. [Holding Company for Metallurgical Industries (HCMI), 100%]	NA	5,000
Gold	kilograms	Sukari Gold Mine Co. [Centamin plc, 50%, and Egyptian Company for Mineral Resources (ECMR), 50%]	Sukari Gold Mine	18,000
Do.	do.	Hamash Misr for Gold Mines (Cypriot Matz Holdings, 50% and Egyptian Company for Mineral Resources (ECMR), 50%]	Hamash Gold Mine ²	500
Gypsum		ASCOM Geology and Mining (Qalaa Holding, 100%)	Ras Sedr, South Sinai	216
Do.		El Nasr Mining Co. [Holding Company for Metallurgical Industries (HCMI), 100%]	NA	NA
Do.		Modern Suez Gypsum Company SAE	Wadi Grendel, Sinai	2,400
Do.		Sinai Manganese Co. (Holding Company for Chemical Industries)	Mine at Ras Mala'ab, South Sinai	400
Iron and steel:				
Direct-reduced		Ezz El-Dekheila Steel Co. (EZDK) (Al Ezz Steel Rebars S.A., 55%)	El-Dekheila I, II, III plants, El-Dekheila, Alexandria	2,320
Do.		Egyptian Sponge Iron and Steel Co. (ESISCO) (Beshay Steel Group)	Plant at Sadat City	2,000
Do.		Suez Steel Co. (Solb Misr)	Suez	1,950
Iron ore		Egyptian Iron and Steel Co. (Hadisolb) [Holding Company for Metallurgical Industries (HCMI), 100%]	El-Gedida Mine, El Bahariya	1,200
Iron oxides		El Nasr Mining Co. [Holding Company for Metallurgical Industries (HCMI), 100%]	Mines near Sinai and Aswan	150
Steel:				
Raw		Al Ezz El-Dekheila Steel Co. (EZDK) [Al Ezz Steel Rebars S.A. (Ezz Steel), 55%]	Alexandria	6,000
Do.		Egyptian Iron and Steel Co. (Hadisolb) [Holding Company for Metallurgical Industries (HCMI)]	Helwan steel plant	600
Do.		Egyptian Steel Group	Ain Al-Sokhna	830
Do.		Egyptian American Steel Rolling Co. S.A.E (Beshay Steel Group)	Sadat City	3,000
Do.		Egyptian Iron and Steel Co. (Hadisolb) [Holding Company for Metallurgical Industries (HCMI), 100%]	Plant at Helwan	1,000

See footnotes at end of table.

TABLE 2—Continued
EGYPT: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Iron and steel:—Continued				
Steel:—Continued				
Raw—Continued		Suez Steel Co. (Solb Misr)	Plant at Helwan	2,000
Flat		Ezz Flat Steel Co. [Al Ezz Steel Rebars S.A. (Ezz Steel), 55%]	Plant at Suez	1,300
Do.		Egyptian Iron and Steel Co. (Hadisolb) [(Holding Company for Metallurgical Industries (HCMI), 100%)]	Plant at Helwan	1,000
Rebar		Egyptian American Steel Rolling Co. S.A.E (Beshay Steel Group)	Sadat City	1,200
Do.		Al Ezz Steel Rebars S.A. (Ezz Steel)	Plant at Sadat City	1,000
Do.		Delta Steel Mill Co.	Plant at Qalyubiya	200
Do.		Egyptian Steel Group	Plant at Ain Al-Sokhna, Suez	530
Do.		do.	Plant at Al Raswa Industrial Zone, Port Said	530
Do.		Ezz Rolling Mills S.A.	Plant at 10th of Ramadan City	500
Do.		Kandil Steel	do.	1,000
Do.		Kouta Steel Group	Plant at Port Said	360
Do.		do.	Plant at Alexandria	300
Do.		Misr National Steel Co.	Plant at Heliopolis	360
Do.		National Port Said Steel	Plant at Port Said	350
Do.		Suez Steel Co. (Solb Misr)	Plant at Ain Al-Sokhna	2,500
Lime		do.	Plant at Suez	183
Do.		Egyptian Sponge Iron and Steel Co. (ESISCO) (Beshay Steel Group)	Plant at Sadat City	2,00
Manganese		Sinai Manganese Co. (Holding Company for Chemical Industries)	Mine at Abu Zenima, South Sinai	110
Methanol		Delta Fertilizers & Chemical Industries Co. (Holding Company for Chemical Industries)	Plant at Talkha, Dakhliya	36
Natural gas	million cubic meters	Egyptian General Petroleum Corp. (EGPC) (Government, 100%)	Abu Madi field	3,800
Do.	do.	do.	Badreddin-3 field	3,000
Do.	do.	do.	Abu Qir-Naf field	1,900
Do.	do.	do.	Ras Shukheir field	1,600
Do.	do.	Grupo Khalda (Repsol YPF, S.A., 50%; Apache Oil Co., 40%; Samsung Corp., 10%)	Khalda field	24
Do.	do.	Joint venture of BP p.l.c., 50%, and Eni Group, 50%	Baltim, El Temsah, Ras el Barr, North Port Said fields	10,000
Do.	do.	Eni Group, 40%; NK Rosneft' PAO, 30%; BP p.l.c., 10%; Melayim Petroleum, 10%; Mubadala Petroleum, 10%	Zohr gasfield, offshore	20,680
Nitrogen:				
Ammonia		Abu Qir Fertilizer & Chemical Industries Co. [private and public interests, 80.9%, and Egyptian General Petroleum Corp. (EGPC), 19.1%]	Abu Qir I plant at Al Tabia, Alexandria	420
Do.		do.	Abu Qir II plant at Al Tabia, Alexandria	365
Do.		Alexandria Fertilizer Co. (Alexfert) (private, 80%, and Abu Qir Fertilizer & Chemical Industries Co., 20%)	Plant at Alexandria	730
Do.		Egypt Basic Industries Corp. (EBIC) (OCI N.V., 60%)	Plant at Ain Al Sokhna	730
Do.		Egyptian Chemical Industries (KIMA) (Chemical Industries Holding Co., 55.7%; public organizations, 39.2%; private investors, 5.5%)	Plant at Aswan	330
Do.		Delta Fertilizers and Chemicals Industries (ASMEDA) (Holding Company for Chemical Industries)	Plants at Talkha, Mansoura	725
Do.		El Nasr Fertilizers and Chemicals Co. (SEMADCO) (Holding Company for Chemical Industries)	Plant at Attaka, Suez	132

See footnotes at end of table.

TABLE 2—Continued
EGYPT: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Nitrogen:—Continued				
Ammonia—Continued		Helwan Fertilizers Co.	Plant at Helwan Freezone	400
Do.		Misr Fertilizer Production Co. S.A.E. (MOPCO) [Egyptian Petrochemical Holdings Co. (ECHEM), 30.75%; National Investment Bank, 12.82%; Egyptian Natural Gas Holding Co. (EGAS), 7.62%; Egyptian Company for Natural Gas, 5.72%; others, 17.10%]	Plant at Damietta Freezone	876
Ammonium nitrate		Abu Qir Fertilizer & Chemical Industries Co. [private and public interests, 80.9%, and Egyptian General Petroleum Corp. (EGPC), 19.1%]	Abu Qir II plant at Al Tabia, Alexandria	876
Do.		Egyptian Chemical Industries (KIMA) (Chemical Industries Holding Co., 55.7%; public organizations, 39.2%; private investors, 5.5%)	Plant at Aswan	800
Do.		Egyptian Fertilizers Co. (EFC) (OCI N.V., 100%)	Plant at Ain Al-Sokhna	325
Do.		Delta Fertilizers and Chemicals Industries (ASMEDA) (Holding Company for Chemical Industries)	Plants at Talkha, Mansoura	328
Do.		El Nasr Fertilizers and Chemicals Co. (SEMADCO) (Holding Company for Chemical Industries)	Plant at Attaka, Suez	200
Nitric acid		Egyptian Chemical Industries (KIMA) (Chemical Industries Holding Co., 55.7%; public organizations, 39.2%; private investors, 5.5%)	Plant at Aswan	600
Do.		Delta Fertilizers and Chemicals Industries (ASMEDA) (Holding Company for Chemical Industries)	Plants at Talkha, Mansoura	328
Do.		El Nasr Fertilizers and Chemicals Co. (SEMADCO) (Holding Company for Chemical Industries)	Plant at Attaka, Suez	193
Do.		Abu Qir Fertilizer & Chemical Industries Co. [private and public interests, 80.9%, and Egyptian General Petroleum Corp. (EGPC), 19.1%]	Abu Qir II plant at Al Tabia, Alexandria	657
Urea		do.	Abu Qir I plant at Al Tabia, Alexandria	566
Do.		do.	Abu Qir III plant at Al Tabia Alexandria	438
Do.		Alexandria Fertilizer Co. (Alexfert) (private, 80%, and Abu Qir Fertilizer & Chemical Industries Co., 20%)	Plant at Alexandria	720
Do.		Egyptian Fertilizers Co. (EFC) (OCI N.V., 100%)	Plant at Ain Al-Sokhna	1,550
Do.		Helwan Fertilizers Co.	Plant at Helwan Freezone	700
Do.		Misr Fertilizer Production Co. S.A.E. (MOPCO) [Egyptian Petrochemical Holdings Co. (ECHEM), 30.75%; National Investment Bank, 12.82%; Egyptian Natural Gas Holding Co. (EGAS), 7.62%; Egyptian Company for Natural Gas, 5.72%; others, 17.10%]	Plant at Damietta Freezone	2,000
Petroleum:				
Crude	thousand 42-gallon barrels	Gulf of Suez Oil Co. [Egyptian General Petroleum Corp. (EGPC), 50%, and BP p.l.c., 50%]	October field, Suez Gulf	45,000
Do.	do.	do.	El Morgan field, Suez Gulf	27,000
Do.	do.	Belayim Petroleum Co. [Egyptian General Petroleum Corp. (EGPC), 50%, and International Egyptian Oil Co., 50%]	Belayim field, Suez Gulf	65,000
Do.	do.	Suez Oil Company [Egyptian General Petroleum Corp. (EGPC), 50%; Deminex SA, 25%; Repsol S.A., 25%]	Ras Budran field, Suez Gulf	15,000

See footnotes at end of table.

TABLE 2—Continued
EGYPT: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum:—Continued				
Pipeline	thousand 42-gallon barrels	Arab Petroleum Pipeline Co. (Governments of Egypt, 50%; Saudi Arabia, 15%; Kuwait, 15%; United Arab Emirates, 15%; Qatar, 5%)	Ain Al-Sokhna to Sidi Kir	875,000
Refined	do.	Cairo Oil Refining Co. (CORC) (Government, 100%)	Mostorod	51,830
Do.	do.	do.	Tanta	12,775
Do.	do.	Alexandria Petroleum Co. (Government, 100%)	Alexandria, El-Mex	36,500
Do.	do.	El Nasr Petroleum Refining Co. (Government, 100%)	Suez	52,195
Do.	do.	Assiut Petroleum Refining Co. [Ganoub El Wadi Holding Co. (Ganope), 100%]	Assiut	18,250
Do.	do.	Ameriya Petroleum Refining Co. (Government, 100%)	Alexandria, Amreya	27,375
Do.	do.	Suez Petroleum Processing Co. (Government, 100%)	Suez	24,820
Do.	do.	Middle East Oil Refinery [Egyptian General Petroleum Corp. (EGPC), 78%; Engineering for Petroleum and Processing Industry (ENPPI), 10%; Petroleum Projects and Technical Consultations Co. (Petrojet), 10%; Suez Canal Bank, 2%]	Alexandria Amreya Freezone	36,500
Do.	do.	Nasr Petroleum Co. (Government, 100%)	Wadi Ferain	3,102
Phosphate:				
Phosphate rock		El Nasr Mining Co. [Holding Company for Metallurgical Industries (HCMII), 100%]	Mines at El Sebaaya, El Quseir, and Red Sea	5,000
Do.		Phosphate Misr Co. S.A.E. [National Investment Bank, 50%; Egyptian Mineral Resources Co. (EMCR), 20%; Ganoub El Wadi Holding Co. (Ganope), 15%; Egyptian General Petroleum Corp., 15%]	Mines at Abu Tartour	5,000
Do.		Al Wadi Al Gadid Company for Mineral Resources and Oil Shale (Wadico)	Mine at Al Wadi Al Gadid	1,000
Do.		Egyptian Company for Mineral Resources (ECMR)	Mine at Aswan	500
Phosphoric acid		Abu Zaabal Fertilizers and Chemicals (private, 100%)	Plant at Qalyubiyah	95
Do.		El-Nasr Company for Intermediate Chemicals	Plant at Giza	NA
Phosphate fertilizer		do.	do.	NA
Do.		Abu Zaabal Fertilizers and Chemicals (private, 100%)	Plant at Qalyubiyah	1,530
Do.		Egyptian Financial and Industrial Co. (private, 100%)	Plant at Kafr El Zayat	900
Do.		do.	Plant at Assuit	750
Do.		Polyserve for Fertilizers and Chemicals (private, 100%)	Plant at Cairo	320
Do.		Suez Company for Fertilizers Production (Egyptian Financial and Industrial Co., 99.8%)	Plant at Ain Al-Sokhna	600
Salt		El Mex Salines Co. (Holding Company for Chemical Industries)	Brine at El Mex, Alexandria	1,400
Do.		do.	Brine at Port Said	350
Do.		El Nasr Salines Co. (Holding Company for Chemical Industries)	Brine at Burj Al-Arab	300
Do.		do.	Mine at Sebika	2,000
Soda ash		Salvoy Alexandria Sodium Carbonate S.A.E.	Plant at Alexandria ³	130
Soda, caustic		Egyptian Petrochemical Co. [Egyptian General Petroleum Corp. (EGPC), 100%]	Plant at Alexandria	120
Sulfuric acid		Abu Zaabal Fertilizers and Chemicals (Government, 100%)	Plant at Qalyubiyah	350
Do.		Egyptian Financial and Industrial Co. (private, 100%)	Plant at Kafr El Zayat	175
Do.		do.	Plant at Assuit	205
Do.		Egyptian Company for Phosphate and Compound Fertilizers (Egypfos)	Plant at Edfu	800
Do.		El Nasr Company for Intermediate Chemicals (NCIC) (Government, 100%)	Plant at Alexandria	165
Do.		El-Nasr Co. for Fertilizer & Chemical Industries (SEMADCO)	Plant at Attaka	300

See footnotes at end of table.

TABLE 2—Continued
EGYPT: STRUCTURE OF THE MINERAL INDUSTRY IN 2016

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Sulfuric acid—Continued	Middle East Oil Refinery [Egyptian General Petroleum Corp. (EGPC), 78%; Engineering for Petroleum and Processing Industry (ENPPI), 10%; Petroleum Projects and Technical Consultations Co. (Petrojet), 10%; Suez Canal Bank, 2%]	Plant at Alexandria Amreya Freezone	20
Do.	Suez Company for Fertilizers Production (Egyptian Financial and Industrial Co., 99.8%)	Plant at Ain Al-Sokhna	425
Stone, sand, and gravel:			
Stone, dolomite	Misr Quarries Development Co. S.A.E	Attaka Mounitain	NA
Sand and gravel:			
Silica (industrial) sand	Egypt for Mining S.A.E (Multi Min)	Abu Heesh Valley, South Sinai	365
Do.	do.	Homayer Valley, South Sinai	366
Do.	Misr Quarries Development Co. S.A.E	Mine at Attaka Mounitain	NA
Do.	Sinai Manganese Co. (Holding Company for Chemical Industries)	Mine at South Sinai	500
Do.	do.	Mine at Zaafarnah, Red Sea	120
Do.	ASCOM Geology and Mining (Qalaa Holding, 100%)	Plant at Minya Industrial Zone	180
Glasswool	ASCOM Carbonate and Chemical Manufacturing (Qulaa Holding, 100%)	Plant at Ain Al-Sokhna	200
Quartzite	El Nasr Mining Co. [Holding Company for Metallurgical Industries (HCMI), 100%]	Mine at Aswan	15
Do.	Egyptian Company for Mineral Resources (ECMR)	Branice near Marsa Alam	NA
Do.	Mining Engineering Company (Knouz)	Mine at Aswan	NA
Do.	Misr Quarried Development Co.	Attaka Mountain	NA
Do.	International Group for Industrial & Agricultural Investment	Marsa Alam and South Aswan	NA
Rockwool	ASCOM Carbonate and Chemical Manufacturing (Qulaa Holding, 100%)	Plant at Ain Al-Sokhna	30
Talc	El Nasr Mining Co. [Holding Company for Metallurgical Industries (HCMI), 100%]	Plant at Aswan	50
Do.	Egyptian Company for Mineral Resources (ECMR) Ltd., 50%, and Egyptian Company for Mineral Resources (ECMR), 50%]	Mine at Southeastern Desert	NA
Do.	Misr Quarries Development Co. S.A.E	Mine at Attaka Mounitain	NA
Tin metric tons	Tantalum Egypt J.S.C. [Tantalum International Pty]	Mine at Abu Dabbab ⁴	660
Titanium, ilmenite	El Nasr Mining Co. [Holding Company for Metallurgical Industries (HCMI), 100%]	NA	120
Do.	Egyptian Company for Mineral Resources (ECMR)	NA	NA

Do., do. Ditto. NA Not available.

¹Under construction.

²On care-and-maintanance status.

³Production stopped in 2016.

⁴Production stopped in 2014.